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Influence of mass media exposure on family planning in Ethiopia: EDHS analytical study

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Impact of mass media exposure on family planning in Ethiopia: EDHS analytical study

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LIST OF ACRONYMS

AOR	adjusted odds ratio
CPR	Contraceptive Prevalence Rate
CSA	central statistic agency
DHS	Demographic and Health Survey
EDHS	Ethiopian demographic and health survey
ESHE	Essential service for Health in Ethiopia
FGAE	Family Guidance Association of Ethiopia
FMOH	Federal Ministry of Health
FP	Family Planning
HEP	Health Extension Program
HEW	Health Extension Worker
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HSDP	Health Service Development Program
ICPD	International Conference on Population and Development
IEC	Information, Education and Communication
IUCD	Intrauterine Contraceptive device
LAM	Lactation Amenorrhea Method
MDG	Millennium Development Goal
OC	Oral contraceptive
SNNP	Southern nation and nationalities people
USAID	United States Agency for international development
UNFPA	United Nation Population Fund

ABSTRACT

Introduction: Family planning programs provide services that help people to achieve the number of children they desire. This family planning was influenced by mass media. Radio and television are two important mass media for disseminating family planning information. However, access to them and exposure to family planning through them are still limited. Low exposure to television, radio and newspaper was found associated with lower use of family planning methods. Exposure to television and newspapers on family planning message significantly increased the use of family planning methods.

Objective: To assess the influence of mass media on family planning in Ethiopia using demographic health survey dataset.

Methods: Secondary data analysis technique was deployed, using the three rounds EDHS (2000, 2005 and 2011) datasets for family planning recode by which the selected variables were merged in to one large dataset. Frequency, bivariate and multivariate analyses were done using SPSS software.

Result: The total number of sample was 28,161 (weighted). The mean age of the study participants was 31 years old. Higher number of participant were from Oromiya(33%) region and 87% from rural. Women who watch television at least once a week was two times more likely to use family planning methods than who watch not at all with AOR: 2.5 (95% CI: 2.125, 2.936; $p < 0.001$). Whereas the odds of listening to radio at least once a weak was, AOR: 1.35 (95% CI 1.179, 1.547; $p < 0.001$). Multivariate analysis shows married women who has radio in the household were 1.6 times more likely to use family planning methods than women who do not possess with AOR of 1.6 (95% CI: 1.501, 1.786; $p < 0.001$).

Conclusion: Mass media had a positive impact on family planning in Ethiopia. Exposures to television, radio and newspaper were found positively associated with use of family planning methods and negative association with the number of desired children.

1. INTRODUCTION

1.1. Statement of the problem

Despite widespread knowledge about family planning among married women of reproductive age, there are still a substantial proportion of women with an unmet need for family planning. Many women want no more children, but are exposed to the risk of pregnancy and are not practicing family planning. This leads to the conclusion that mere knowledge of family planning is not enough, and that there is a need for strong motivation and knowledge about family planning methods. High population growth, unmet need for family planning rate and low contraceptive prevalence rate can leads to high rate of infant, child and maternal mortality as well as abortion. One way of addressing these issues is mass media (2, 4, 5).

Radio and television are two important mass media for disseminating family planning information. However, access to them and exposure to family planning through them are still limited. Low exposure to television, radio and newspaper was found associated with lower use of family planning methods. Exposure to television and newspapers on family planning message significantly increased the use of family planning methods (2, 3).

In developing countries, exposure to mass media has increased rapidly in recent years. In light of the dramatic increases in access to mass media, there was little done to see the association of mass media exposure with family planning methods utilization(1). In addition women had low knowledge on how much is mass media important for family planning.

As far as my literature review is concerned, there is no research done on the impact of mass media on family planning in Ethiopia. Therefore, this study will be done to describe the influence of mass media on family planning which can initiate governmental and non-governmental organization who works on family planning to emphasize on media promotion to reach the larger community in the country.

1.2. Literature review

Mass media are widely used to expose high proportions of large populations to messages through routine uses of existing media, such as television, radio, and newspapers. Over the past two decades the world has evolved in dramatic ways with regard to mass communication and public health. A communication revolution occurred that has blurred the traditional distinctions between mass and inter- personal communication, and it changed in many ways how we must think about using the media to promote the public's health (6). The USA mass media campaign has been consistently associated with an increase in anti tobacco attitudes and beliefs and is responsible for 22% of the observed decline in youth smoking within three years.

Most mass media campaigns on public health have notably been aimed at tobacco use and heart-disease prevention, but have also addressed alcohol and illicit drug use, cancer screening and prevention, sex-related behaviors, child survival, and many other health-related issues. Typical campaigns have placed messages in media that reach large audiences, most frequently via television or radio, but also outdoor media, such as billboards and posters, and print media, such as magazines and newspapers. Exposure to such messages is generally passive, resulting from an incidental effect of routine use of media. The great promise of mass media campaigns lies in their ability to disseminate well defined behaviorally focused messages to large audiences repeatedly, over time, in an incidental manner, and at a low cost per head(6, 7).

One of the importance of mass media is to family planning programs which provide services that help people to achieve the number of children they desire, to reduce the number of unwanted pregnancies, to reduce the risk of sexually transmitted infection, and to improve the health of women and children by spacing birth(8, 9).

The influence and pervasiveness of the mass media can be found everywhere around us today, and they are everywhere respected. These family planning programs were addressed through mass media, since human beings have always needed and desired information for survival as they face life and its several threatening situations. Such needs and desires are being met in every life by mass media (10, 11).

Family planning is one of the most efficacious and cost-effective means of improving individual health, gender equity, family well-being, and national development. Increasing contraceptive use and reducing unmet need for family planning are central to improving maternal health. In less-developed regions of the world, especially Sub-Saharan Africa and South Asia, human and financial resources are limited, modern contraceptive use is relatively low, unmet need for modern contraception is high, and consequently maternal morbidity and mortality are high (12).

In developing countries, exposure to television has increased rapidly in recent years. In Asia, one estimate in 2003 indicated a six-fold increase, to 650 million sets since the 1980s. In China alone, access to satellite cable television increased from 270,000 households in 1991 to 14 million by 2005. Data collected in the Demographic and Health Surveys (DHS) over the past two decades also show steady increases in television exposure (1).

1.2.1. Mass media in Ethiopia

The mass media in Ethiopia consist of radio, television, newspaper and magazines. In comparison to the length of Ethiopia's over 2,000 year history as a sovereign nation, the media is a very recent phenomenon. Many radio broadcast stations are licensed to operate in Ethiopia. The major radio broadcasting stations include Radio Ethiopia, Radio Fana a private station, Amhara radio, oromiya radio and others.

In the recent year, there have been emerging some FM radio stations like FM Addis 97.1 (24 hours transmitter), FM 96.3 (Addis Ababa Administration Gov't radio), FM 102.1 (Private-public radio), FM 105.1 (English and some other foreign language based radio) and others. Most of the FM radio stations have 18 hours air time. Television broadcast network in Ethiopia includes: Ethiopian Television (ETV 1 and ETV 2), with 24 hours of broadcast with some regional stations, namely Addis TV, TV Oromiyaa , Dire TV and others. Radio and TV broadcasts occur in a variety of languages (13).

1.2.2. History and progress of family planning in Ethiopia

A modern FP service in Ethiopia is pioneered by The Family Guidance Association of Ethiopia (FGAE) that was established in 1966. FGAE's only family planning services were provided from a single-room clinic run by one nurse. FGAE's program activities and services are gradually spread all over the country with a network of 8 branches, 18 clinics, 26 youth centers, 740 community-based reproductive health service outlets, 242 outreach sites, 6 marketplace and 8 workplace sites. Since 1980, The Ministry further expanded its FP services with cyclic country support programs by UNFPA and other stakeholders(5).

With the adoption of The Population Policy in 1993, local and international institutions partnered with the government in expanding FP programs and services. The National Office of Population was then established to implement and oversee the strategies and actions related to The Population Policy. In 1996, The Ministry of Health released 'Guidelines for FP services in Ethiopia' to guide stakeholders as well as expand and ensure quality FP services. In this guideline, the ministry designed new outlets for FP services in addition to the pre-existing facility based and outreach FP services. Moreover, integration and linkage of FP services with other RH services has been emphasized in other policy and strategic documents to enhance FP utilization (5, 14).

Ethiopian population has grown steadily over the last three decades, from 39 million in 1984, when the first census was conducted, to 53.5 million in 1994 and 73.8 million in 2007, in the subsequent censuses. The population growth rate has declined slightly, from 3.0% per annum in 1984 to 2.9% in 1994 and 2.6% in 2007.The current population is estimated at 84 million (projected from the 2007 census). This makes Ethiopia the second most populous country in Africa. Ethiopia has a very young population with 44% of its total population under the age of 15. Women of reproductive age constitute 24% of the population(15).

1.2.3. Mass media and health

Mass media campaigns to promote healthy behaviors and discourage unhealthy behaviors have become a major tool of public health practitioners in their efforts to improve the health of the public. Interventional studies shows the influence of mass media on smoking behavior, HIV testing behavior, promoting cancer screening behavior and prevention and control of other diseases. Mass media campaign has impacted on smoking behavior by disclosing the negative consequence of smoking like lung cancer(16, 17).

Mass media programs and campaigns have been mostly used in three major ways to influence smoking related knowledge, attitudes, and behavior: to inform the public of the negative health consequences of cigarette smoking and to try to motivate existing smokers to quit; to promote specific smoking cessation actions to those smokers motivated to quit, such as calling a hotline or requesting specific materials such a tip-sheet or a self-help manual; and to provide smoking cessation "self-help clinics" to those smokers who desire to quit(17, 18).

Presently, there are many mass media programmes designed to educate the public about the need to live a healthy life, stem down the spread of STI and HIV/AIDS. One of these, radio drama was used to challenge stigmatization and to urge people to accept and help people living with HIV/AIDS. It was also confirmed the successful use of radio to convey health and hygiene messages related to preventing diarrhea diseases in children. The goal of the programme was to reduce infant and child mortality through prevention and treatment of diarrhea(19).

1.2.4. Mass media and family planning

All available channels and outlets shall be used to ensure coordinated behavioral change communication messages and activities reach the population. The channel of choice for these activities should be based on the target audience and the local availability and acceptability of the channel. The communication channels include Newspapers, Magazines, Radio, Television, Leaflets, Brochures and Posters(9).

Many studies show the influence of these communication channels or mass media. One analytical study from 48 developing countries show that women who watch television sometimes are 1.6 times more likely to use modern contraception than are women who watch no television at all. For women who report daily exposure to television, this ratio increases to 2.4 times more. Overall, the odds of using modern contraception are roughly 2 to 1 for women who watch television (1). Among all countries in this analysis, such messages had been seen on television in the past month by 27 percent of the women and heard on radio by 40 percent.

Negative association was seen between watching television and the number of children desired. The average number of children desired ranges from 5.2 children for women who do not watch television to 3.2 children for those who are daily viewers. The influence of television on the number of children desired is greater than that of radio. Radio, television, and cinema have a strong positive effect upon current contraceptive use and the intended future use of contraception. For the most part, with only a few exceptions in sub-Saharan Africa, television exposure shows a stronger association with the use of modern contraception than does radio exposure (1, 20).

Radio and television are two important mass media for disseminating information about family planning. However, access to them and exposure to family planning through them are still limited, particularly for television. Slightly more than one-fourth (28·0%) of the respondents reported that their household possessed a working radio and only 8·6% reported that they had a working television and in Kenya in 2000 KDHS, 68.4% of married women listen radio at least once a week and radio were owned by 60.7% while only 4.5% report owning a television set(2). The differential analysis of mass media

exposure to family planning indicates that exposure is lower among the rural, illiterate and poor class of people in terms of household possessions.

Another study in Bangladesh on the impact of mass media on family planning shows that women who are exposed to family planning radio messages have a 13·0% higher chance of being current users of modern contraceptive methods compared with those who have no exposure to family planning radio messages. Again, the probability of being a current user of modern contraceptive methods is increased by 26·0% if women are exposed to family planning TV messages and by 37·0% if women are exposed to family planning poster messages, compared with those who are unexposed to family planning TV messages and poster messages respectively. Also, women possessing a TV in their household have 18·0% higher chance of being a current user of modern contraceptive methods compared with those possessing no TV in their household. The small numbers of women who have seen messages about family planning in newspapers or magazines have a particularly low level of fertility (21, 22).

The use of family planning practice was found to be 48.4 percent in India but 54.4 percent among the women exposed to television programmes on family planning methods. Married women who were exposed to family planning messages in television were 2.44 times more likely to use the family planning methods than not exposed. The use of family planning was 12.7 percent more among women exposed to radio than those not exposed. Women who were exposed to radio messages on family planning methods were 1.66 times more likely to use the family planning methods. The use of family planning methods was 1.96 times more among women reading newspapers carrying family planning messages. The women exposed to family planning messages in television were 2.14 times more likely to practice family planning methods than those unexposed. The women exposed to newspapers carrying family planning messages were 2 times more likely to practice family planning compared to those who were not exposed (3).

Similar study in Pakistan on women who were regularly exposed to television was 1.6 times more likely to use family planning methods than non exposed. Women who had heard family planning messages on the radio were 1.5 times as likely as other women to use family planning method. Exposure of family planning through Print media 1.7 times, radio 1.6 times, and television 2.2 times more likely to use the method than non exposed(23).

1.2.5. Family planning utilization

Global family planning programs have been in existence in the developing world for several decades and are primarily designed to supply couples with the methods of family planning that best suit their needs. Over the years, family planning programs have changed to meet the needs of the people receiving the services as well as the donors providing the services(1).

The 2013 family planning datasheet describes as percentage women of reproductive age who were using a family planning methods was 63% for the entire world, 72% for more developed countries, 62% for less developed regions (54% when China was excluded) and 34 for least developed countries .This rate was 33% for Africa, and 26 % for sub Saharan Africa, 33% for eastern African (maximum Kenya 45% and minimum Eritrea 8%). On a global level, the most widely used forms of fertility control are female sterilization (18%), the IUD (13%), pill (8%), male condoms (8%), iniectables (5%), male sterilization (3%) and other methods (2%) (24). Family planning programs have been the primary means of reducing fertility rates. However, despite years of investment in programs, fertility declines are not always apparent, nor are they continuous. Lifetime births per woman (TFR) was 2.5 globally and 5.2 for sub Saharan Africa but it was found 1.6 for more developed countries(10, 24).

Although declining in many developing countries, unmet need for family planning remains significant, especially in the least developed countries. Potential reductions of unmet need have implications for the future decline of fertility. The 2013 family planning datasheet describes unmet need for family planning 17% worldwide and 25% in sub Saharan Africa (10, 24).

1.2.6. Trends of family planning

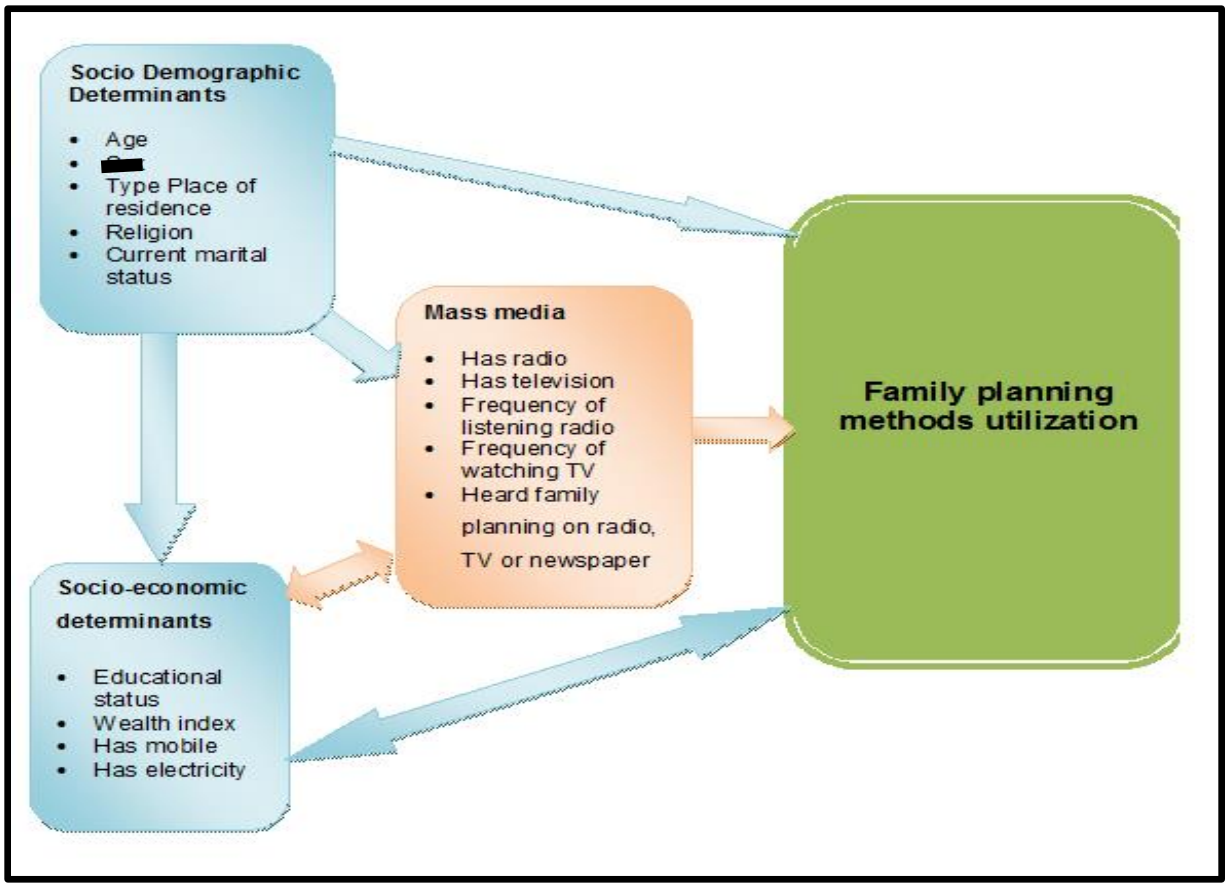
Ever use of any family planning methods among married women of reproductive age has been increasing in all countries except Rwanda. In Rwanda, ever use of contraception declined from 42 percent in 1992 to 36 percent in 2001. The rate of increase in ever use of contraception varies considerably from country to country. As expected, the rate of increase is steeped in countries with lower levels of ever use, whereas in countries like Colombia and the Dominican Republic, which had already reached high levels of ever use by the mid-1990s, the rate of increase has slowed in recent years(10).

Study on trends of family planning in Kenya shows rate of 6.7 births per woman which is a sharp decline from the 7.7 rate reported in a 1984 National survey. This trend is attributable to a 50% increase in the use of contraception between 1984 and 1989, with a doubling in the proportion of women protected by a modern method. Trends of unmet need were constant between 1998 and 2003, at 24% in 1998 and 25% in 2003. In each of the surveys unmet need for spacing is higher than that for limiting. A similar trend is observed for current use of contraceptive methods. In 1993 current use of family planning methods was 33%, increased to 39% in 1998, but then was only slightly higher in 2003, at 41%. The percentage using contraception for limiting births is always greater than that for spacing. The sum of the percentage of currently married women using contraception and the percentage with an unmet need equals the total potential demand for family planning. Total demand decreased slightly from 68% in 1993 to 63% in 1998 but rose to 66% in 2003 (25, 26).

Ethiopia has set its own goals for population articulated in the population policy as a TFR of 4 and CPR of 44% by 2015. The population size has doubled five and half times from 11.5 millions in 1900 to 74 million in 2007. The demographic transitions in Ethiopia is characterized by an initial slow growth at a rate of less than 1.5 % per annum until the 40s which then accelerated between 1955 to 1995 to 3% after which the annual growth rate declined slowly and is currently maintained at 2.6%. The population doubling time currently is estimated to be of 23 years (9, 27).

1.2.7. Conceptual framework

The purpose of theoretical framework in the study of impact mass media on family planning is to clarify our understanding of the many factors involved for the knowledge and utilization of family planning and largely to show the impact of mass media on family planning. The framework contains socio demographic determinants, socio economic determinants and knowledge and utilization of family planning related with mass media.



Source: this conceptual was developed by the investigator to show the relationship of mass media with family planning, may 2014.

Figure 1. Conceptual framework which shows the relationship of mass media with family planning in Ethiopia from EDHS data sets.

1.3. Justification of the study

This study will help researchers, organizations working on family planning, the community and policy makers. Since, there were no researches done on the impact of mass media on family planning in Ethiopia as far as my review, this study can be used as a baseline for other studies on the topic.

The study will give clue on the impact of mass media on family planning in Ethiopia for governmental and non-governmental organization who works on family planning to emphasize on media promotion to reach the larger community in the country. Mass media acts as a channel of diffusion contributing to the increased use of family planning. By using mass media we can promote family planning which in return saves lives of women and children and improves the quality of life for all. Organizations working on family planning uses mass media to address and educate the negative effect of unwanted pregnancy (21). It is one of the best investments that can be made to help ensure the health and well-being of women, children, and communities.

Knowing the impact mass media for family planning will be important for married women to decide on the exposure of mass media. It will increase the number of women who will expose to mass media so as to prevent the negative effect of unplanned family and consequence of unwanted pregnancy(5). Policy makers would also use this finding to emphasis on mass media for family planning promotion.

Therefore this study aims at studying the impact of mass media exposure on family planning and associated factors.

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2. OBJECTIVE

2.1. General objective

- To assess the influence of mass media exposure on family planning in Ethiopia from demographic health survey dataset

2.2. Specific objective

- To describe the influence of mass media exposure on family planning among married women
- To determine the effect of television and radio ownership on family planning among married women
- To describe the trend of mass media and family planning among married women through the three EDHS

3. METHODS AND MATERIALS

3.1. Study design

Secondary data analysis technique was deployed to study the impact of mass media on family planning, using the three Ethiopia Demographic and Health Surveys (2000, 2005 and 2011) datasets for family planning recode by which the selected variables were merged in to one large dataset. The surveys were conducted in February-June 2000, April-August 2005, and December 2010-June 2011.

DHS: The DHS program was established by the United States Agency for International Development (USAID) in 1984. It was designed as a follow-up to the World Fertility Survey and the Contraceptive Prevalence Survey projects. The DHS project was first awarded in 1984 to Westinghouse Health Systems (which subsequently evolved into part of OCR Macro). The project has been implemented in overlapping five-year phases; DHS-I ran from 1984 to1990; DHS-II from 1988 to1993; and DHS-III from 1992 to1998. In 1997, DHS was folded into the new multi-project MEASURE program as MEASURE DHS+(28).

The Ethiopia Demographic and Health Survey (EDHS) is part of the worldwide MEASURE DHS project which is funded by the United States Agency for International Development (USAID). The survey was implemented by the Ethiopian Central Statistical Agency (CSA). The funding for the EDHS was provided by the HIV/AIDS Prevention and Control Office (HAPCO), USAID, the United Nations Population Fund (UNFPA), the United Kingdom for International Development (DFID), the United Nations Children's Fund (UNICEF), Federal Republic of Ethiopia, Essential Services for Health in Ethiopia (ESHE), and the Centers for Disease Control and Prevention (CDC). ICF International provided technical assistance through the MEASURE DHS project (29)-(30).

Three major EDHS are conducted so far in the country namely EDHS 2000, 2005 and 2011.

3.2. Study area

Ethiopia, officially known as the Federal Democratic Republic of Ethiopia, is a country located in the horn of Africa. It is bordered by Eritrea to the north, Djibouti and Somalia to the east, Sudan and South Sudan to the west, and Kenya to the south. Ethiopia is the most populous landlocked country in the world and the second-most populated nation on the African continent, with over 84 million inhabitants (2013 estimates). It occupies a total area of 1,104,300 km^2 and has its capital city is Addis Ababa which is the seat of Ethiopian Government, Africa Union Commission and the UN Economic Commission for Africa (15, 31).

The country divided into 11 administrative divisions of which 9 regional States and 2 City Administrations (Addis Ababa & Dire Dawa). Population Growth Rate was 2.6 percent. The Ethiopian economy is free market economy and was one of the 10 fastest growing countries in the world with a GDP growth of 11% for 9 successive years. The health system was three-tier by integrating Primary Health Care Unit (PHCU), General Hospital and Specialized Hospital (15).

3.3. Source population

The source population for this study was all married women in the age of 15- 49 in Ethiopia

3.4. Study population

The study populations for this study were all married women of age 15-49 and were registered at the three Ethiopian Demographic and health Survey from 2000 to 2011.

3.4.1. **Inclusion criteria:** all married women of age 15 to 49

3.4.2. **Exclusion criteria:** women with no record of family planning methods

3.5. Sample Size and sampling procedure

The 2000 Ethiopia Demographic and Health Survey (DHS) is a nationally representative survey of 15,367 women age 15-49 in which 4543 (urban) and 10, 824 (rural) and 2,607 men age 15-59. The Ethiopia DHS is the first comprehensive nationally representative population and health survey conducted in Ethiopia and the first to be implemented as part of the worldwide Demographic and Health Surveys (DHS) project.

Whereas the second, the 2005 Ethiopia Demographic and Health Survey (EDHS) took nationally representatives of 14,070 women age 15-49 in which 4423 (urban) and 9647(rural) and 6,033 men age 15-59.

And the third and the recent Ethiopia Demographic and Health Survey interviewed a nationally representative population in about 16,515 households in which all women age 15-49 which are 5329(urban) and 11,186(rural), and all men age 15-59 in these households.

A two-stage stratified-cluster sampling was used for all the three surveys. In both the 2000 and the 2005 Ethiopia DHS, the sampling was based on the Census Enumeration Areas (CEAs) of the 1994 Population and Housing Census of Ethiopia. First, a sample of 540 (139 urban and 401 rural) CEAs was selected using systematic sampling from all regions. Then, 27 and 24–32 households per CEA were selected systematically in 2000 and 2005, respectively. This resulted in a total of 14 642 households and 15 716 eligible women in 2000, and 14 645 households and 14 717 eligible women in 2005. The 2011 survey was based on the 2007 National Population and Housing Census of Ethiopia [16]. This survey has sought to select 624 CEAs (187 urban and 437 rural) resulting in 18 720 households and 17 385 eligible women. Response rates for the first, second, and third surveys were 97.8% (n = 15 370), 95.6% (n = 14069), and 95% (n = 16 515), respectively.

These three dataset were merged into a single data set which contains the variable of interest for this study. The total number of women from the three EDHS was 45,952. From which married women will be selected, n1= 9,203 (2000 EDHS), n2=8,438 (2005 EDHS) and n3= 9,478 (2011 EDHS). The total number of unweighted was 27,119 (from

the three EDHS). But when this dataset were weighted with individual women's individual sample weight, the weighted sample become n1= 9,653 (2000 EDHS), n2= 8,914 (2005 EDHS), n3= 9,594 (2011 EDHS) and the total number was 28,161 from the three EDHS.

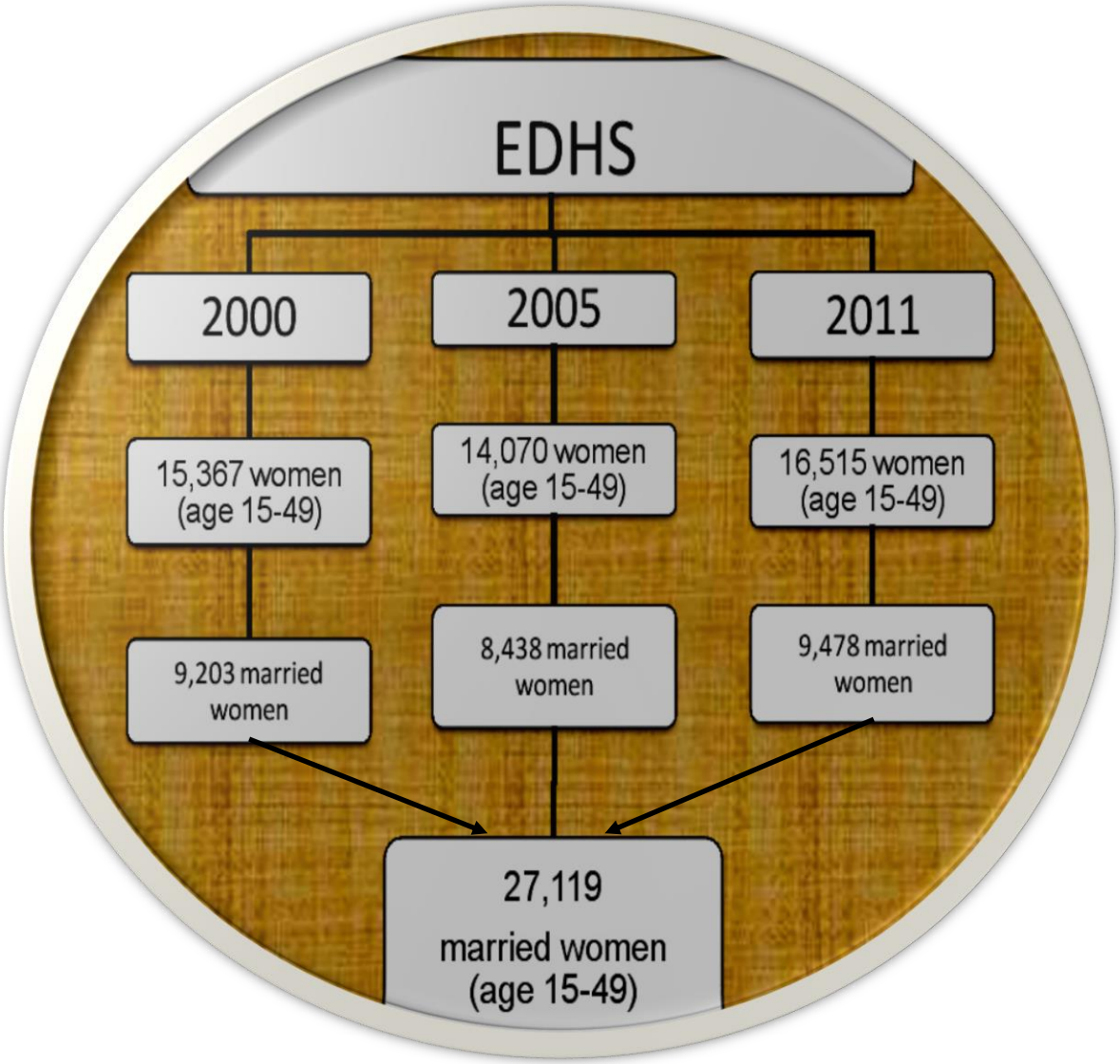

Figure 2. Diagrammatic representation showing the sampling technique for this study from surveyed women in the age of 15-49 from the three EDHS(2000, 2005 and 2011)

3.6. Study variables

3.6.1. Outcome/ dependent variable: family planning methods utilization

3.6.2. Explanatory/ Independent variables:

- EDHS year
- Women current age
- Women age group
- Region
- Religion
- Type of place of residence
- Highest educational level
- Heard family planning on radio last few months
- Heard family planning on TV last few months
- Heard family planning in newspaper/magazine last few months
- Read FP pamphlet/posters/leaflets last months
- Heard FP at community event/conversation
- Knowledge of any method
- Desire for more children
- Frequency of watching television
- Frequency of listening to radio
- Frequency of reading newspaper
- Wealth index

⇨ Details of explanatory variables were annexed

3.7. Operational definitions

Mass media: for this study it was a way of mass communication and includes television, radio and newspaper or magazine.

Wealth index: indicates the economic status of women in this study. Wealth index was divided into five groups or quintiles and are:

1= “Poorest”, 2= “Poorer”, 3= “Middle”, 4= “Richer”, 5= “Richest”

Quintiles: each of five equal groups into which population can be divided according to the distribution of values of a variable.

Family Planning: Refers to the use of various methods of fertility control that will help to have the number of children they want and when they want them in order to assure the well being of children and the parents. Family planning simply means preventing unwanted pregnancies by safe methods of prevention.

Total fertility rate: Total number of children a woman would have by the end of her reproductive period, if she experienced the currently prevailing age-specific fertility rates throughout her childbearing life. TFR is one of the most widely used fertility measures to assess the impact of family planning programs**.**

3.8. Data collection

The three EDHS data sets were downloaded from MEASURE DHS website after getting the permission for downloading and using it for further purpose. The zipped file for family planning data subset was selected and opened by the software; Statistical Package for Social Scientists (SPSS) for Windows version.

As mentioned above the secondary data which used for this study were obtained from 2000, 2005 and 2011 EDHS. The surveys were conducted by the Central Statistics Authority (CSA) with the financially supported by Essential Service for Health in Ethiopia (ESHE) project coordinating with USAID, UNFPA and the Federal Democratic Republic of Ethiopia (29, 30, 32).

Ethiopian Demographic and Health Survey (EDHS) is a compressive survey designed to provide estimates for the health and demographic variables of interest for the following domains: Ethiopia as a whole; urban and rural areas of Ethiopia (each as a separate domain); and 11 geographic areas (9 regions and 2 city administrations).

There are about 3665 variables and 30 appropriate variables were selected from a total variable available in the data set from each of the three EDHSs and then the variables were merged in to one large data set for the analysis purpose.

The selection of appropriate variables was done after reviewing different literatures and books written on mass media and family planning.

3.9. Data management and analysis

Some categorized variables were further edited by combining some of their groups in one or two groups either because of the small number observations in those categories or to make the analysis and the interpretation more meaningful.

There were three levels of analysis deployed. The first was the descriptive analysis to examine the distribution of the respondents in terms of the explanatory variables used in the study. This was achieved by conducting distribution table and calculating the frequency and proportion of contraceptive use in each category within the selected explanatory variables. The second was the binary logistic regression analysis to examine the relationship between the selected mass media variables and utilization of family planning. This was done through the analysis of the odd ratios (OR) using the binary logistic regression which adopts one of the categories in each variable as a reference group and then compares to it the other categories.

Bivariate and multivariate logistic regression statistical models were used, which mainly gives an elaborated explanation and estimation of the probability of the outcome with respect to the effects of the different determinant factor. Binary logistic regression was done using the dependent variable contraceptive use and the independent variable or covariate, mass media.

4. ETHICAL CONSIDERATION

The data was found free of any incentive from MEASURE DHS (Demographic and Health Survey). Therefore ethical clearance was not needed instead permissions was assured from MEASURE DHS website, in order to use the data set for further analysis.

5. RESULT

5.1. Characteristics of respondents

The total numbers of study participants were 27,119 (28,161 weighted number) married women 15-49 years of age from the three Ethiopian demographic health surveys of which 9,203 (9,653 weighted number) from EDHS 2000, 8,438 (8,914 weighted number) from EDHS 2005 and 9,478 (9,594 weighted number) from EDHS 2011. The mean age of the participant was 31 year with SD= ±8.6 which were similar for the three EDHS and about half of the respondents were below 30 years old.

The highest numbers of respondents were from Oromoyaa region which 33% and the lowest were in were from Harari region and was 0.2% of the total number. About 85% of the respondents were from the three regions of Ethiopia called Oromiya, Amhara and SNNP.

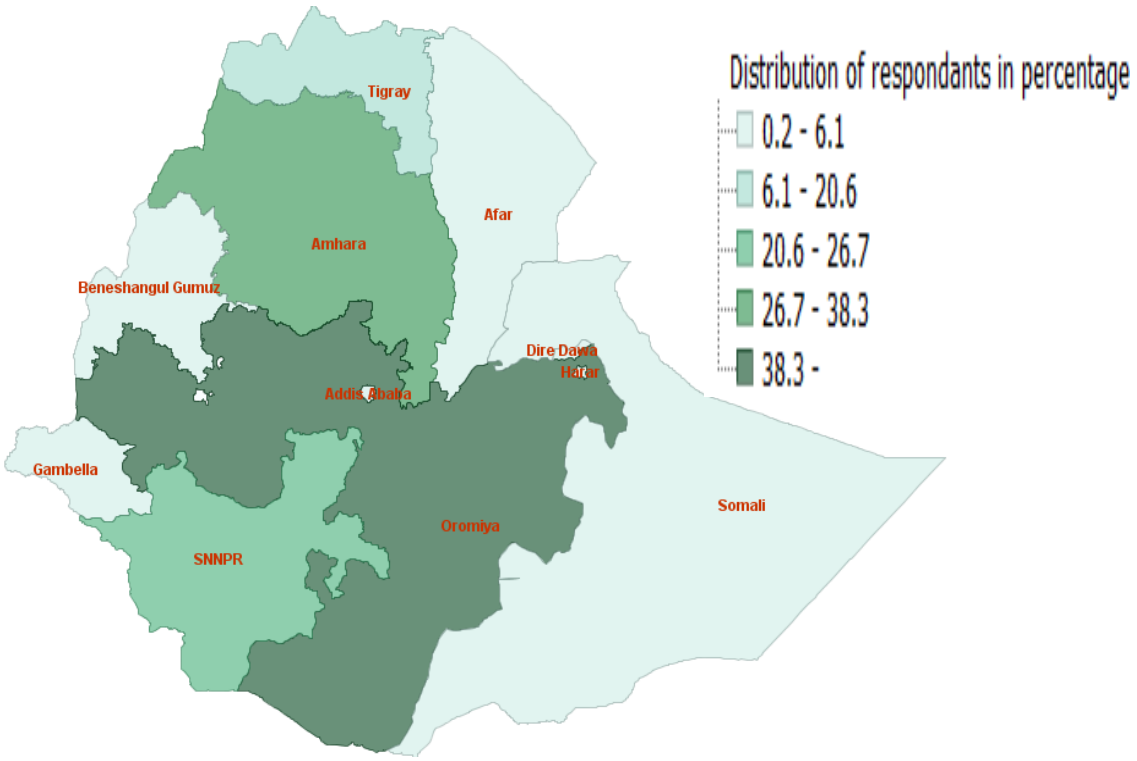

Figure 3. Distribution of respondents through the Ethiopian regions in Ethiopia from the three EDHS survey (2000, 2005 and 2011)

The majority of married women participated in the study were orthodox and Muslim worshipers, 46 and 31 percent respectively in the three EDHS. Protestants, traditional and other religions account the remaining 23% of the religions in Ethiopia. Over eight out of ten respondents live in rural areas which was 87% from the three EDHS.

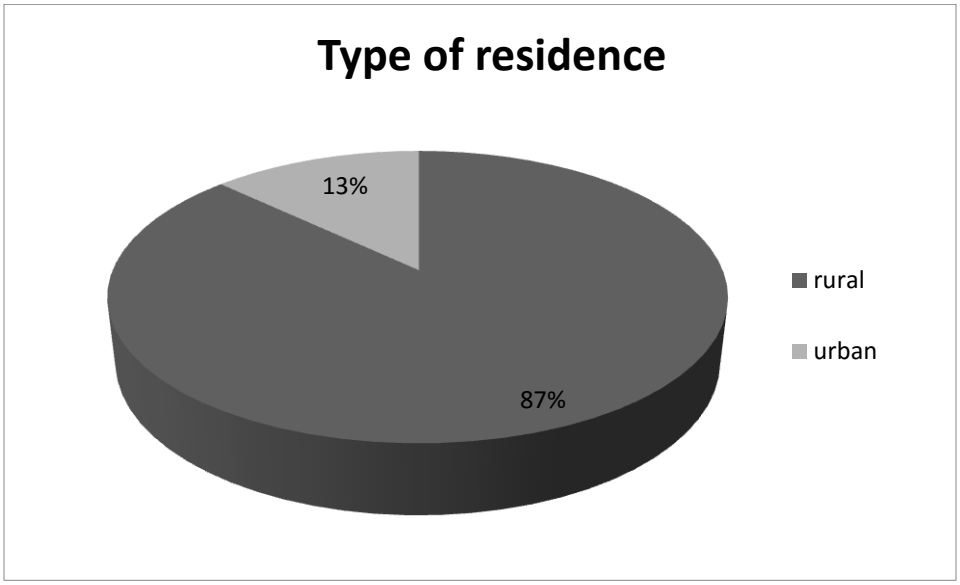

Figure 4. Percentage of respondents with type of residence in Ethiopia from the three EDHS (2000, 2005 and 2011)

Above three quarter of married women 15-49, 76%, had no education. Numbers of non educated women were decreased from the first to the third EDHS and was 83%, 79% and 67% in EDHS 2000, 2005 and 2011 respectively. Married women 15-49 at Higher education was increased from 0.5% in EDHS 2000 to 2.8% in EDHS 2011.

Electricity coverage for married women in the three EDHS was still limited, with a very large disparity between urban and rural residents. In urban areas the proportion married women 15-49 own electricity rose from 74 percent in 2000 to 84 percent in 2005 but then decreased in 2011and became 79 percent. In rural areas the percentage increased from 0.3% percent in 2000 to 1.9% percent in 2005 and 4.1% percent in 2011.

Wealth quintiles were divided in to five scores called lowest (poorest), second (poorer), middle, forth (richer) and highest (richest). There were no much difference on wealth quintiles within each EDHS, where the lowest wealth quintiles was between 15-20% and

the highest was between 18-19% of respondents. From all the respondents of the three EDHS, only 10.2% of rural residents were in the highest quintiles where as in urban dwellers it was 74.8%. From the 11 regions 94% of women from Addis Ababa were within highest wealth quintiles. Highest wealth quintile was lower in Amhara in which only 13% of women in the region scores highest wealth quintile.

Table 1. Socio demographic characteristics of married women age 15-49 in Ethiopia from the three EDHS (2000, 2005, and 2011).

variables	Category	2000 EDHS	2005 EDHS	2011 EDHS	TOTAL
Age 5-year groups	15-19	850	689	706	2247
		8.80%	7.70%	7.40%	8.00%
	20-24	1774	1530	1612	4917
		18.40%	17.20%	16.80%	17.50%
	25-29	2022	2039	2343	6406
		21.00%	22.90%	24.40%	22.70%
	30-34	1548	1529	1617	4695
		16.00%	17.20%	16.90%	16.70%
	35-39	1425	1326	1487	4239
		14.80%	14.90%	15.50%	15.10%
	40-44	1081	943	960	2984
		11.20%	10.60%	10.00%	10.60%
	45-49	949	855	865	2670
		9.80%	9.60%	9.00%	9.50%
Region	Tigray	585	546	598	1729
		6.10%	6.10%	6.20%	6.10%
	Affar	123	107	103	335
		1.30%	1.20%	1.10%	1.20%
	Amhara	2554	2305	2664	7524
		26.50%	25.90%	27.80%	26.70%
	Oromiya	3736	3257	3782	10776
		38.70%	36.50%	39.40%	38.30%
	Somali	111	358	226	696
		1.20%	4.00%	2.40%	2.50%
	Ben-Gumz	109	90	120	320
		1.10%	1.00%	1.30%	1.10%
	SNNP	2120	1952	1717	5789
		22.00%	21.90%	17.90%	20.60%
	Gambela	28	30	33	91
		0.30%	0.30%	0.30%	0.30%
	Harari	21	21	25	67
		0.20%	0.20%	0.30%	0.20%
	Addis	225	208	291	724
		2.30%	2.30%	3.00%	2.60%
	Dire Dawa	37	35	30	104
		0.40%	0.40%	0.30%	0.40%
Religion	Orthodox	4748	4058	4236	13043
		49.20%	45.50%	44.20%	46.30%
	Catholic	80	101	85	267
		0.80%	1.10%	0.90%	0.90%
	Protestant	1565	1669	1999	5233
		16.20%	18.70%	20.80%	18.60%
	Moslem	2904	2862	3107	8874
		30.10%	32.10%	32.40%	31.50%

	Traditional	331	132	81	545
		3.40%	1.50%	0.80%	1.90%
	Other	23	87	0	111
		0.20%	1.00%	0.00%	0.40%
Type of place of residence	Urban	1119	918	1641	3678
		11.60%	10.30%	17.10%	13.10%
	Rural	8533	7995	7952	24482
		88.40%	89.70%	82.90%	86.90%
Has radio	No	7308	5685	5261	18254
		75.70%	63.80%	54.80%	64.80%
	Yes	1990	3117	4030	9138
		20.60%	35.00%	42.00%	32.50%
Has television	No	9156	8447	8390	25994
		94.90%	94.80%	87.50%	92.30%
	Yes	142	354	894	1391
		1.50%	4.00%	9.30%	4.90%
Highest educational level	No education	8040	7003	6388	21432
		83.30%	78.60%	66.60%	76.10%
	Primary	1127	1374	2599	5102
		11.70%	15.40%	27.10%	18.10%
	Secondary	433	453	332	1219
		4.50%	5.10%	3.50%	4.30%
	Higher	51	83	272	407
		0.50%	0.90%	2.80%	1.40%
Has electricity	No	8445	7875	7669	23990
		87.50%	88.40%	79.90%	85.20%
	Yes	853	922	1623	3398
		8.80%	10.40%	16.90%	12.10%
Quintiles of wealth index	Not dejure resident	354	109	300	764
		3.70%	1.20%	3.10%	2.70%
	Lowest quintile	1517	1732	1960	5210
		15.80%	19.40%	20.40%	18.50%
	Second quintile	1852	1864	1990	5708
		19.30%	20.90%	20.80%	20.30%
	Middle quintile	2437	1886	1963	6287
		25.40%	21.20%	20.50%	22.40%
	Fourth quintile	2040	1797	1849	5687
		21.30%	20.20%	19.30%	20.20%
	Highest quintile	1743	1632	1829	5205
		18.20%	18.30%	19.10%	18.50%
Has a mobile telephone (from household)	No			7173	7173
				74.80%	74.80%
	Yes			2119	2119
				22.10%	22.10%
Total		9653	8914	9594	28161
		100.00%	100.00%	100.00%	100%

5.2. Mass media exposure

The 2000, 2005 and 2011 EDHS assessed ownership of radio and television and exposure to the media by asking how often a respondent reads a newspaper, watches television, or listens to the radio. Radio ownership was increased from 21% in 2000 EDHS to 35% in 2005 EDHS and 42% in 2011 EDHS. Similarly television ownership increased from 1.5% in 2000 EDHS to 4% in 2005 EDHS and 9.3% in 2011 EDHS.

Table 2. Frequency of mass media exposure of married women age 15-49 in Ethiopia from the three EDHS data (2000, 2005 and 2011).

Mass media variables		EDHS			Total
		2000	2005	2011	
Has radio	No	7308	5685	5261	18255
		75.70%	63.80%	54.80%	64.80%
	Yes	1990	3117	4031	9138
		20.60%	35.00%	42.00%	32.50%
Total		9652	8912	9592	28157
		100.00%	100.00%	100.00%	100.00%
Has television	No	9156	8448	8391	25995
		94.90%	94.80%	87.50%	92.30%
	Yes	142	355	894	1391
		1.50%	4.00%	9.30%	4.90%
Total		9653	8912	9585	28150
		100.00%	100.00%	100.00%	100.00%
Frequency of reading newpaper or magazine	Not at all	9093	8272	8550	25916
		94.20%	93.00%	89.30%	92.10%
	Less than once a week	479	547	807	1834
		5.00%	6.20%	8.40%	6.50%
	At least once a week	31	47	221	300
		0.30%	0.50%	2.30%	1.10%
	Almost every day	47	28	0	74
		0.50%	0.30%	0.00%	0.30%
Total		9650	8894	9579	28123
		100.00%	100.00%	100.00%	100.00%
Frequency of listening to radio	Not at all	7121	5588	4443	17152
		73.80%	62.70%	46.40%	60.90%
	Less than once a week	1654	2203	3229	7086
		17.10%	24.70%	33.70%	25.20%
	At least once	209	253	1911	2374

	a week	2.20%	2.80%	19.90%	8.40%
	Almost every day	666	864	0	1530
		6.90%	9.70%	0.00%	5.40%
Total		9651	8909	9583	28142
		100.00%	100.00%	100.00%	100.00%
	Not at all	8998	7914	6019	22931
		93.30%	89.00%	62.80%	81.50%
	Less than once a week	446	614	2450	3511
Frequency of watching television		4.60%	6.90%	25.60%	12.50%
	At least once a week	72	825	1113	1267
		0.70%	0.90%	11.60%	4.50%
	Almost every day	132	285	0	417
		1.40%	3.20%	0.00%	1.50%
Total		9648	8896	9582	28126
		100.00%	100.00%	100.00%	100.00%

Frequency of listening to radio, watching television and reading newspaper were very low even if it was increased from EDHS 2000 to EDHS 2011. Frequency of listening radio at least once a weak was 17% in 2000, and increased to 24% in 2005 and in 2011 about 34% of married women 15-49 listen radio at least once a weak. As ownership of television is very low, frequency of watching television at least once a weak was 0.7%, 0.9% and 11.6% in 2000, 2005 and 2011 EDHS respectively.

Generally radio exposure was higher among married women in compared to television and news paper exposure. Where 24% married women were exposed to radio in 2000, 37% in 2005 and 54% in 2011. 7% married women exposed to TV in 2000, 11% in 2005 and 37% in 2011. The least was exposure to print media, in which only 6% of married women exposed to newspaper in 2000, 7% in 2005 and 11% in 2011 as shown in the above table.

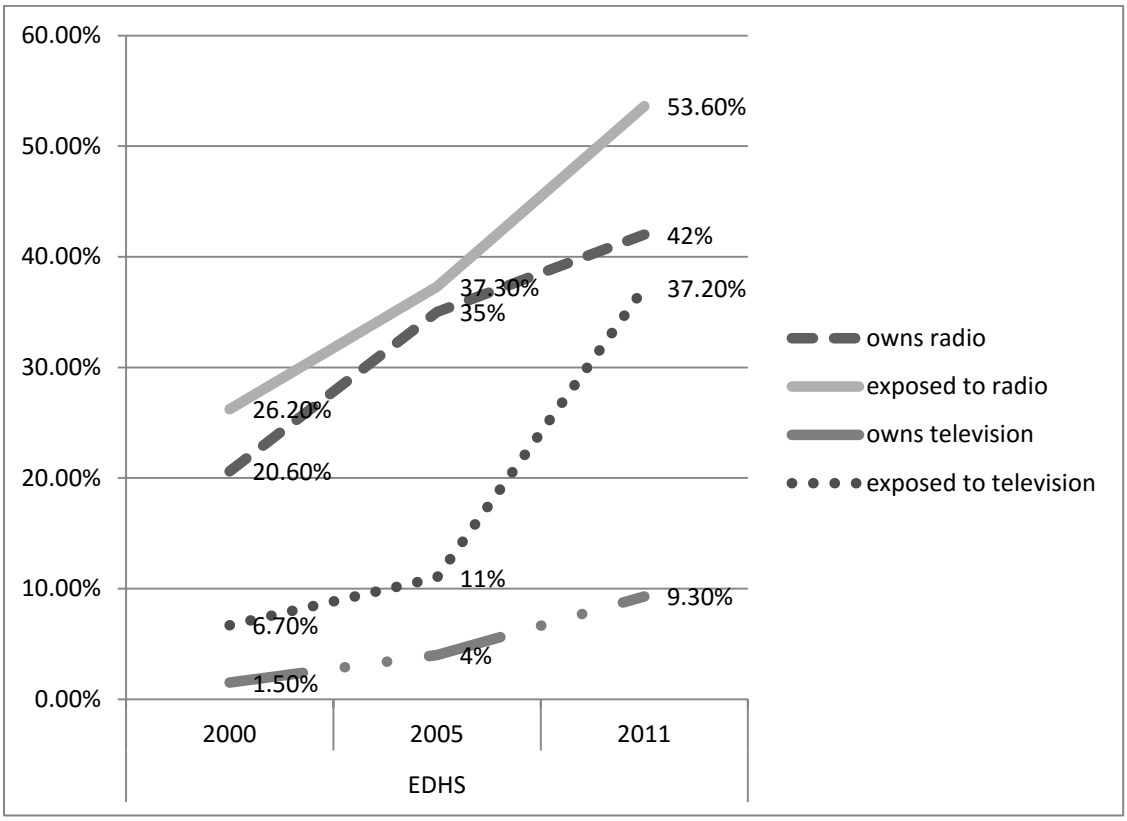

Figure 5. The difference in mass media ownership and mass media exposure among married women in Ethiopia from EDHS (2000,2005 and 2011)

In 2000 EDHS the gap between ownership and exposure to TV has been 5.2%, in 2005 EDHS it was increased to 7% and in 2011 EDHS the gap the difference becomes wider which is about 28%. Between radio ownership and exposure, in 2000 EDHS the difference has been 6%, in 2005 it becomes 2.3% and in 2011 increased to 11.6%.

In this study, 32.5% of women possess radio and only 4.9% of women possess television. From all married women who owns radio, 27.3% of them uses family planning methods, however from women who own television, 54.2% uses family planning.

Table 3. Family planning utilization among married women who owns radio and television in Ethiopia from the three EDHS (2000, 2005 and 2011)

Category			Family planning use		Total
			Yes	No	
Has radio	**No**	Count	2087	16167	18254
		%	11.40%	88.60%	100.00%
	Yes	Count	2498	6639	9138
		%	27.30%	72.70%	100.00%
Has television	**No**	Count	3827	22167	25995
		%	14.70%	85.30%	100.00%
	Yes	Count	754	637	1391
		%	54.20%	45.80%	100.00%

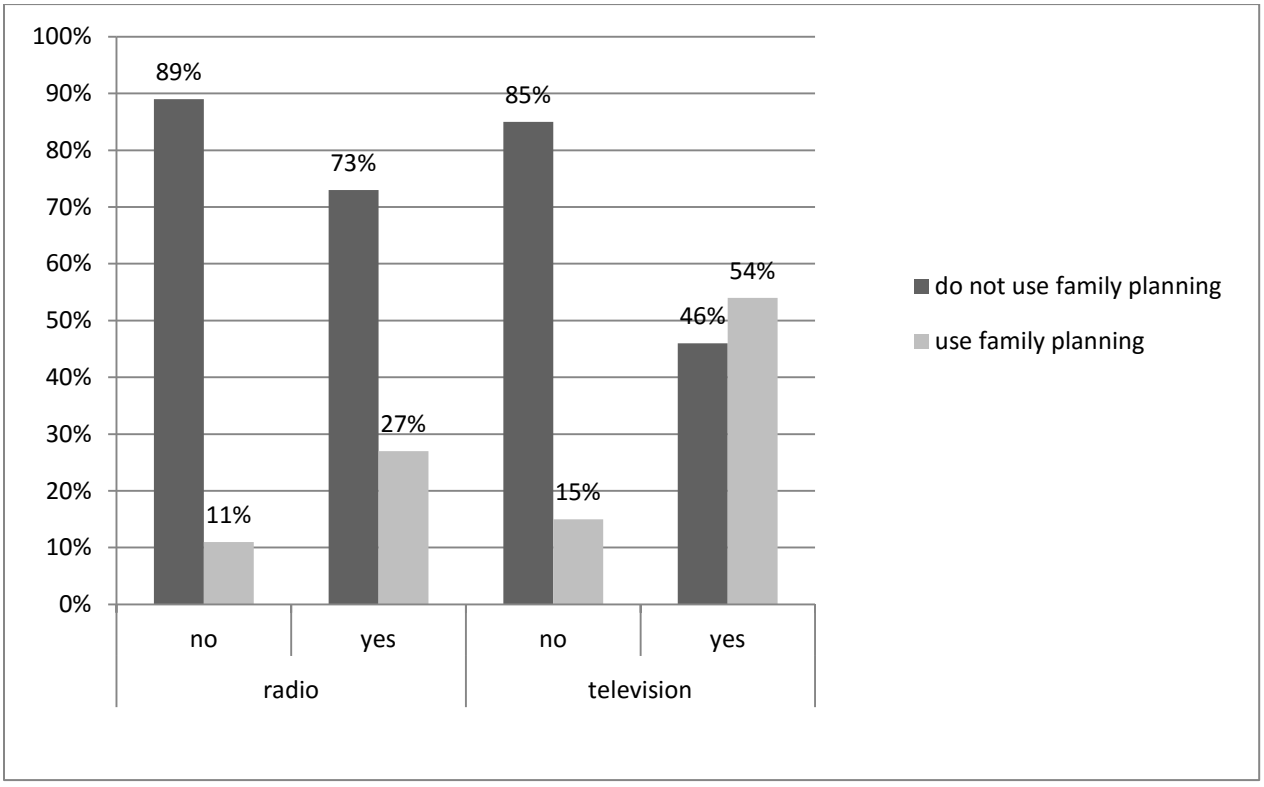

Figure 6. Percentage of family planning method users among married women (age 15-49) who possess radio and television in Ethiopia from the three EDHS (2000, 2005 and 2011)

Table 4 shows a negative association between watching television and the number of children desired. The average number of children desired ranges from 6.2 children for women who do not watch television to 4.3 children for those who were watching at least once a week.

Table 4. Frequency of mass media exposure and average desired number of children in Ethiopia from the three EDHS (2000, 2005 and 2011)

Mass media		Average Desired number of children
Listening radio	Not at all	6.14
	Less than once a week	5.58
	At least once a week	4.81
Watching television	Not at all	6.23
	Less than once a week	5.25
	At least once a week	4.28

5.3. Exposure to family planning messages

In the 2011 EDHS, among married women age 15-49 community events are the most common source of family planning messages, at 37.3 percent. Radio is the second most common at 30.3 percent. These figures were lower in the previous EDHS in which 14.4 percent in 2000, and 24.9 in 2005, listen family planning messages through radio. Another common source is television, with 14 percent of women reporting exposure to family planning messages via television.

Married women in this study did not have high exposure to written sources of family planning messages. Only 2, 4 and 5 percent of women report seeing family planning messages in a newspaper or magazine in 2000, 2005 and 2011 respectively.

Among women, there is a slight variation in exposure to printed family planning messages by their background characteristics. Women in the two lowest age categories, age 15-24, have higher levels of exposure to family planning messages in a newspaper or magazine or in pamphlets, posters, or leaflets than women in upper categories. A higher proportion of urban women than rural women are exposed to messages from each source.

Table 5. Exposure of family planning messages through mass media among married women of age 15-49 in Ethiopia from the three EDHS data (2000, 2005 and 2011)

Family planning messages		2000 EDHS	2005 EDHS	2011 EDHS	Total
Heard FP on radio last months	No	8259	6687	6684	21631
		85.60%	75.10%	69.70%	76.80%
	Yes	1388	2223	2908	6520
		14.40%	24.90%	30.30%	23.20%
Total		9648	8910	9593	28150
		100.00%	100.00%	100.00%	100.00%
Heard FP on TV last months	No	9422	8368	8281	26071
		97.70%	93.90%	86.30%	92.60%
	Yes	225	545	1311	2081
		2.30%	6.10%	13.70%	7.40%
Total		9646	8914	9592	28152
		100.00%	100.00%	100.00%	100.00%
Heard FP newspaper last months	No	9461	8566	9152	27180
		98.10%	96.10%	95.40%	96.60%
	Yes	183	347	438	967
		1.90%	3.90%	4.60%	3.40%
Total		9644	8913	9590	28147
		100.00%	100.00%	100.00%	100.00%
Read FP pamphlet/ posters/le aflets last months	No			9120	9120
				95.20%	95.20%
	Yes			456	456
				4.80%	4.80%
Total				9577	9577
				100.00%	100.00%
Heard FP at communit y event/con versation	No			6011	6011
				62.70%	62.70%
	Yes			3573	3573
				37.30%	37.30%
Total				9585	9585
				100.00%	100.00%

5.4. Mass media and family planning

To see the impact of mass media on family planning utilization logistic regression model was used for bivariate and multivariate analysis. As shown in the table below, bivariate analysis shows that most of the independent variables were significantly associated with the use of family planning methods. Since each independent variable has confounding effect on the other variable, multivariate analysis was done to reduce the effect.

Presence of radio and television in the households had influence on married women on the utilization of family planning methods. Multivariate analysis shows married women who has radio in the household were 1.6 times more likely to use family planning methods than women who do not possess with AOR of 1.6 (95% CI: 1.501, 1.786; $p < 0.001$). However the influence of radio ownership on utilization of family planning methods has decreased from the first EDHS in contrary to frequency of ownership, which was AOR: 2.1 (95% CI: 1.724, 2.621; $p < 0.001$) in 2000, AOR: 1.5 (95% CI: 1.28, 1.78; $p < 0.001$) in 2005 and AOR: 1.4 (95% CI: 1.26, 1.59; $p < 0.001$) in 2011 EDHS. Similarly women who had television in their home were 1.4 times more likely to use family planning which was almost similar through the three EDHS.

The impact of watching television was found higher than listening to radio and reading news paper. Women who watch television at least once a week was two times more likely to use family planning methods than who watch not at all with AOR: 2.5 (95% CI: 2.125, 2.936; $p < 0.001$). Whereas the odds of listening to radio at least once a weak was, AOR: 1.35 (95% CI 1.179, 1.547; $p < 0.001$).

Most of the respondents hear family planning messages through radio than television and newspaper, in which 23% heard family planning messages in radio, 7% in television and only 3% on newspaper. Hearing of family planning messages for the past month through radio had higher impact on family planning utilization with AOR: 1.5 (95% CI: 1.321,1.592;P<0.001).

Table 6. bivariate and multivariate analysis or unadjusted odds ratio for family planning use by mass media coverage and exposure of married women (15-49) in Ethiopia from the three EDHS

Mass media variables		Family planning methods utilization		Crude OR with 95% CI	Adjusted OR with 95% CI
		yes	No		
has radio	No	14916	1669	1.00	1.00
	Yes	6876	2961	3.849 (3.601, 4.113)	1.637 (1.501, 1.786)**
has television	No	20531	3256	1.00	1.00
	Yes	1262	1373	6.86 (6.302, 7.468)	1.398 (1.212, 1.612)**
frequency of reading newspaper	not at all	20928	3357	1.00	1.00
	less than once a week	1172	1115	5.931 (5.422, 6.488)	1.817 (1.618, 2.039)**
	at least once a week	174	204	7.309 (5.951, 8.977)	1.65 (1.303, 2.089)**
	almost every day	69	66	5.963 (4.247, 8.373)	1.311 (0.9, 1.911)
frequency of listening to radio	not at all	14768	1602		1.00
	less than once a week	5027	1609	2.951 (2.734, 3.184)	1.334 (1.211, 1.469)**
	at least once a week	1398	767	5.058 (4.567, 5.601)	1.35 (1.179, 1.547)**
	almost every day	1161	769	6.106 (5.499, 6.78)	1.406 (1.211, 1.632)**
frequency of watching to television	not at all	18915	2272		1.00
	less than once a week	2141	1134	4.41 (4.054, 4.797)	2.279 (2.059, 2.522)**
	at least once a week	828	782	7.863 (7.065, 8.751)	2.498 (2.125, 2.936)**
	almost every day	452	560	10.314 (9.045, 11.762)	2.086 (1.701, 2.558)**
heard FP on radio last months	No	18027	2353	1	1.00

	Yes	4332	2397	4.239 (3.969, 4.528)	1.45 (1.321, 1.592)**
heard FP on TV last months	No	20802	3134	1	1.00
	Yes	1556	1615	6.889 (6.365, 7.456)	1.288 (1.127, 1.472)**
heard FP on newspaper last months	No	21704	3994	1	1.00
	yes	652	753	6.276 (5.621, 7.007)	1.042 (0.9, 1.206)

Note: 1.00 = Reference, ** = p < 0.001, * = p < 0.05

5.5. Trends of mass media and family planning

Mass media ownership and family planning were increased dramatically from 2000 EDHS to 2011 EDHS. As shown below in the figure married women who own radio were 20.6% in 2000 and increased to 35 and 42% in 2005 and 2011 respectively.

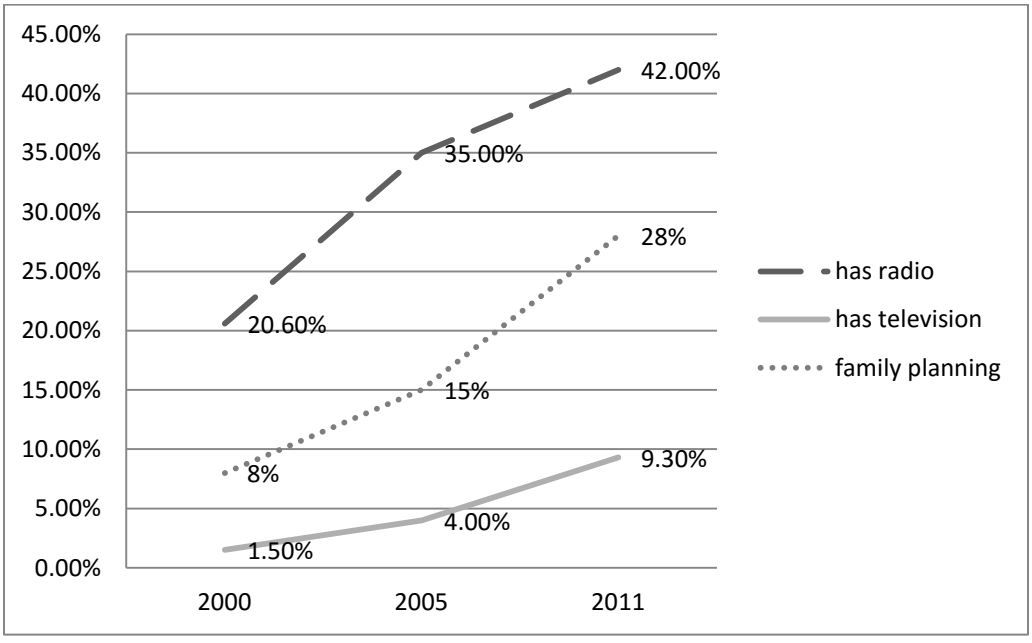

Figure 7. Trends of family planning with possession of radio and telvision in Ethiopia from the three EDHS (2000, 2005 and 2011)

Even though mass media become increased starting from 2000 EDHS to 2011 similar to family planning (figure 6), the impact of this mass media on family planning were found almost similar within the three EDHS (figure 7).

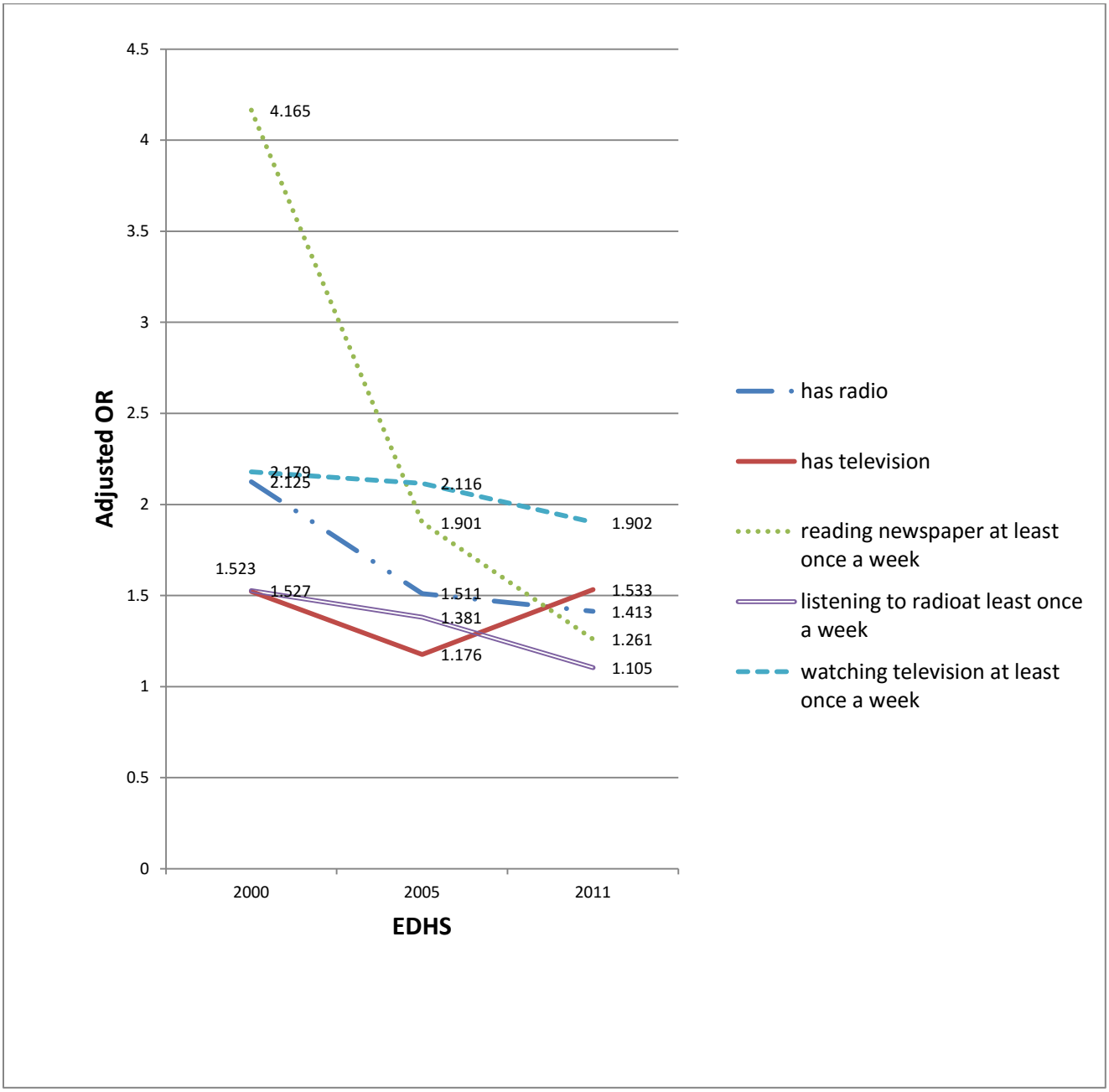

Figure 8. Trends of influence of mass media on family planning in Ethiopia from the three EDHS (2000, 2005 and 2011)

6. DISCUSSION

Although mass media have impact on the prevention and control of many public health problems, this study is concerned on the impact of mass media on family planning among married women (age 15-49) in Ethiopia from the three demographic health surveys. The highest numbers of participants were from Oromiya region with 33% and the lowest were in from Harari region and were 0.2% of the total number. Over eight out of ten respondents live in rural areas which was about 87% of the participants. This shows that there were proportional allocations of study participants throughout the Ethiopian region and place of residence.

It was shown that mass media exposure increased in each EDHS but lower than most developing countries. In 2011, 37% of women exposed to television which was lower than those developing countries (49%). In 2000 EDHS 26% of married women were exposed to radio and 7% to television which is lower than Pakistan where 33% exposed to radio and 46% to television in similar DHS(1, 23). In 2005 EDHS, exposure to mass media among married women was increased to 47% for radio and 11% for television. In 2011 it becomes 54% and 47% for radio and television respectively. The increase in mass media exposure can be due to the increase in mass media technology and women's awareness on mass media.

Radio and television are two important mass media for disseminating information about family planning. However, access to them and exposure to family planning through them are still limited, particularly for television. In 2011 EDHS, 42% of married women owns radio and 9.3% owns television which is higher than Bangladesh where 28 % of the respondents reported that their household possessed a working radio and only 8.6% reported that they had a working television(2).

In this study it was found that there were some differences between possession of radio or television and their exposure status of mass media. From all married women 32.5% had radio and 4.9% had television in their household but 39.1% were exposed to radio and 18.5% were exposed to television. In 2000 EDHS the gap between ownership and exposure to TV has been 5.2%, in 2005 EDHS it was increased to 7% and in 2011

EDHS the gap the difference becomes wider which is about 28%. Between radio ownership and exposure, in 2000 EDHS the difference has been 6%, in 2005 it becomes 2.3% and in 2011 increased to 11.6%.The difference with ownership of this mass media elements and exposure status may be due to two possible reasons, the first is there may be more than one married women in the household and the second is women may be exposed to mass media at their neighbor. But the increase in ownership and exposure through the three EDHS may be due to socio economic development.

Number of married women who owns radio was higher than the number of married women with television, but the impact on family planning was greater for television owners, where 54.2% of television owners uses family planning which is parallel with the study in India where 54.4% of television owners use family planning (3). The possible explanation for this was mostly television was owned by women in the urban area and better living style. These factors can shift the family planning higher for TV owners than radio owners. The other possible reason would be Television messages were more interesting and can easily get into individual's mind than radio does. We mostly believe what we see rather than what we hear.

Frequency of listening radio among married women in this study was lower than many developing countries, in which 54% of women listen daily or monthly where as a study from 48 developing countries throughout the world shows 68% of married women listens daily or monthly in the same DHS year (2011).Similarly watching television was 37% for daily or monthly viewers, lower than Asia and northern Africa (85%) but higher than eastern and southern Africa which was 25 % (1, 23).

There were a negative association between watching television and the number of children desired. The average number of children desired ranges from 6.2 children for women who do not watch television to 4.3 children for those who were at least once a week viewers similar to west and middle Africa which was 6.3 and 4.9 respectively(1).

Community events are the most common source of family planning messages in 2011 which is 37.3 percent. Radio is the second most common at 30.3 percent, lower than Bangladesh In which 42% of women get family planning messages via radio, 17% via

television and 14% via print media(2). Another common source is television, with 14 percent of women reporting exposure to family planning messages via television.

Married women in this study did not have high exposure to written sources of family planning messages. Only 2, 4 and 5 percent of women reported seeing family planning messages in a newspaper or magazine in 2000, 2005 and 2011 respectively. This may be due to educational status of women, where above three quarter of married women (76%) had no education (table 1), and inaccessibility of print media to the rural community.

The impact of watching television was found higher than listening to radio and reading newspaper. Women who watch television at least once a week were two times more likely to use family planning methods than who watch not at all with AOR: 2.5 (95% CI: 2.125, 2.936; $p < 0.001$) but 1.6 for whom listen radio once a week. This is similar for most reviewed study like a study in 48 developing countries, Bangladesh and India. In India, women exposed to television were 2.14 times more likely to use family planning but 1.13 for radio listeners (1-3) .

Although mass media was increased starting from 2000 EDHS to 2011, the impact of this mass media on family planning were found almost similar within the three EDHS. These may be due to parallel increase of mass media exposure and family planning utilization through the three EDHS.

7. STRENGTH AND LIMITATION OF THE STUDY

7.1. Strength

Since the survey was collected with international standard and trained data collectors, it will have good data quality.

7.2. Limitation

The data were collected for survey, rather than for research purpose and needs some efforts to select the variable of interest. Some of the variables focusing on mass media and family planning were incomplete or not filled as the will of the investigator. The surveys were limited to verbal behavior or documents provide information only about respondent's non verbal behavior.

8. CONCLUSION AND RECOMMENDATION

In this study mass media shows a positive impact on family planning in Ethiopia among married women of age 15-49. Exposures to television, radio and newspaper were found positively associated with use of family planning methods and negative association with the number of desired children. Ownership of radio and television have also influence on family planning. Married women with radio or television in their household were low. Many married women listened radio and watch television while they have not possessed radio or television in their household. Although all the electronic and print Medias have their own impact on family planning, exposure to television shows greater influence on the use of family planning methods than other media elements.

Based on the findings of the current study, we forwarded the following recommendations:

For the government

- Since mass media shows influence on family planning the government should promote family planning using different mass media

For organizations working on family planning

- Organizations working on family planning should focus promoting family planning on television , since it has higher influence than other media elements

For women

- Women should give emphasis to take those media messages into action because exposure to family planning message shows similar influence with exposure to any mass media
- Since the influence of television for family planning was higher, women should increase their television exposure

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10. ANNEXES

Annex one: explanatory variables

	Variable name	Variable definition
	Socio demographic characteristics	
	EDHS year	1= “2000”, 2=“2005” 3= “2011”
	Women current age	
	Women age group	1= “15-19”, 2= “20-24”, 3= “25-29, 30-34, 35-39, 40-44, 45-49
	Region	1 = "Tigray" , 2 = "Affar" , 3 = "Amhara", 4 = "Oromiya" , 5 = "Somali" , 6 = "Benishangul-Gumuz" , 7 = "SNNP" , 12 = "Gambela" , 13 = "Harari" , 14 = "Addis Ababa" , 15 = "Dire Dawa" ,
	Religion	1 = "Orthodox", 2 = "Catholic", 3 = "Protestant" , 4 = "Muslim" , 5 = "Traditional" , 96 = "Other"
	Type of place of residence	1 = "Urban" , 2 = "Rural"
	Number of living children	
	Current marital status	0= “Never in union”, 1= “Married”, 2= “Living with partner”, 3= “Widowed”, 4= “Divorced”, 5= “No longer living together/separated”
	Women’s occupation	0 = "Not working" ,1 = "Prof., Tech., Manag." , 2 = "Clerical" , 3 = "Sales", 4 = "Agric-self employed", 5 = "Agric-employee", 6 = "Household & domestic", 7 = "Services" ,8 = "Skilled manual" , 9 = "Unskilled manual" 98 = "Don't know"
	Highest educational level	0= “No education”, 1= “Primary”, 2= “Secondary”, 3= “Higher”
	Mass media, Knowledge and utilization of family planning	
	Heard family planning on radio last few months	0= “no” , 1= “yes”

	Heard family planning on TV last few months	0= “no” , 1= “yes”
	Heard family planning in newspaper/magazine last few months	0= “no” , 1= “yes”
	Read FP pamphlet/posters/leaflets last months	0= “no” ,1= “yes”
	Heard FP at community event/conversation	0= “no” , 1= “yes”
	Knowledge of any FP method	0= “Knows no method”, 1= “Knows only folkloric method” 2= “Knows only traditional method” 3= “Knows modern method”
	Desire for more children	1= “Wants within 2 years”, 2= “Wants after 2+ years” , 3= “Wants, unsure timing” , 4= “Undecided”, 5= “Wants no more”, 6= “Sterilized (respondent or partner)” 7= “Declared infecund”, 8= “never had sex”
	Ideal number of children	
	Ideal number of children (grouped)	
	Current contraceptive method	0= “Not using”, 2= “Pill”, 3= “IUD”, 4= “Injections”, 5= “Condom”, 6= “Female sterilization”, 7= “Periodic abstinence”, 8 =”Withdrawal”, 9= “Other” 10=”Implants/Norplant”, 11= “Lactational amenorrhea (LAM)”, 11= “Female condom” 12=“Standard days method”
	Current use by method type	0= “No method”, 1= “Folkloric method”, 2= “Traditional method”, 3= “Modern method”
	Decision maker for using Contraception decision	1= “mainly respondent”, 2= “mainly husband, partner”, 3= “joint decision”, 6= Others”
	Intention to use	1= “Use later”, 2= “Unsure about use”, 3= “Does not intend”
	Number of children age 5 and under	
	Unmet need	0= “Never had sex”, 1= “Unmet need for spacing”, 2= “Unmet need for limiting”, 3= “Using for spacing”, 4=”Using for limiting”,

		5= “No unmet need”, 6= “Not married and no sex in last 30 days”, 7= “ Infecund, menopausal”
	Contraceptive use and intention	1= “Using modern method”, 2= “Using traditional method”, 3= “Non-user - intends to use later”, 4= “Does not intend to use”, 5= “never had sex”
	Frequency of reading newspaper or magazine	0= “Not at all”, 1= “Less than once a week”, 2= “At least once a week”
	Frequency of listening to radio	0= “Not at all”, 1= “Less than once a week”, 2= “At least once a week”
	Frequency of watching television	0= “Not at all”, 1= “Less than once a week”, 2= “At least once a week”
	Socio economic characteristics	
	has radio	0= “no”, 1= “yes”, 7= “not a dejure resident”
	has television	0= “no”, 1= “yes”, 7= “not a dejure resident”
	Wealth index	1= “Poorest”, 2= “Poorer”, 3= “Middle”, 4= “Richer”, 5= “Richest”
	Has electricity	0= “no”, 1= “yes”, 7= “not a dejure resident”
	Has mobile	0= “no”, 1= “yes”, 7= “not a dejure resident”

Annex two: Dummy tables

Table 7. socio demographic and economic characteristics of study population

	Socio demographic characteristics	Category	Use family planning methods		Not use family planning methods		Total	
			Num	Percent	Number	Percent	Number	Percent

			ber					
	EDHS year	2000						
		2005						
		2011						
	Women age group	15-19						
		20-24						
		25-29						
		30-34						
		35-39						
		40-44						
		45-49						
	Region	Tigray						
		Affar						
		Amhara						
		Oromiya						
		Somali						
		Benishangul-Gumuz						
		SNNP						
		Gambela						
		Harari						
		Addis Ababa						
		Dire Dawa						
	Religion	Orthodox						
		Catholic						
		Protestant						
		Muslim						
		Traditional						
		Other						

	Type of place of residence	Urban						
		Rural						
	Current marital status	Never in union						
		Married						
		Living with partner						
		Widowed						
		Divorced						
		Separated						
	Women's occupation	Not working						
		Working						
		Don't know						
	Highest educational level	No education						
		Primary						
		Secondary						
		Higher						
	Wealth index	Poorest						
		Poorer						
		Middle						
		Richer						
		Richest						

Table 8. Logistic regression for exposure to mass media and family planning methods utilization in Ethiopia

	Variables	**category**	**Family planning methods utilization**		**Crude OR(95% CI)**	**Adjusted OR(95% CI)**
			Yes	**No**		

	has radio	No				
		Yes				
		Not a dejure resident				
	has television	No				
		Yes				
		Not a dejure resident				
	Has mobile	No				
		Yes				
		Not a dejure resident				
	Heard family planning on radio last few months	No				
		Yes				
	Heard family planning on TV last few months	No				
		Yes				
	Heard family planning in newspaper/magazine last few months	No				
		Yes				
	Read FP pamphlet/posters/leaflets last months	No				
		Yes				
	Heard FP at community event/conversation	No				
		Yes				
	Knowledge of any method	Knows no method				
		Knows only folkloric method				
		Knows only traditional method				

		Knows modern method				
	Frequency of reading newspaper or magazine	Not at all				
		Less than once a week				
		At least once a week				
	Frequency of listening to radio	Not at all				
		Less than once a week				
		At least once a week				
	Frequency of watching television	Not at all				
		Less than once a week				
		At least once a week				

Annex: three

Table 9. multivariate analysis of mass media elements with family planning methods utilization for each EDHS in Ethiopia (2000, 2005 and 2011 EDHS)

Variables	Categories	2000 EDHS				2005 EDHS				2011 EDHS				Total			
		p-value	Adjusted OR	95.0% C.I. for AOR		p-value	Adjusted OR	95.0% C.I.for AOR		P-value	Adjusted OR	95.0% C.I.for AOR		p-value	Adjusted AOR	95.0% C.I.for AOR	
				Lower	Upper			Lower	Upper			Lower	Upper			Lower	Upper
heard FP on radio last month	No	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	yes	<0.001	1.551	1.265	1.901	<0.001	1.534	1.29	1.824	<0.001	1.273	1.115	1.454	<0.001	1.45	1.321	1.592
heard FP on TV last month	No	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	yes	0.233	1.188	0.895	1.578	0.099	1.255	0.958	1.644	0.004	1.319	1.095	1.589	<0.001	1.288	1.127	1.472
heard FP on newspaper last month	No	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	yes	0.748	0.951	0.701	1.29	0.902	1.016	0.794	1.299	0.722	1.048	0.811	1.353	0.582	1.042	0.9	1.206
has radio	No	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	yes	<0.001	2.125	1.724	2.621	<0.001	1.511	1.282	1.78	<0.001	1.413	1.256	1.59	<0.001	1.637	1.501	1.786
	not dejure	0.271	1.263	0.833	1.915	0.781	1.079	0.63	1.847	0.07	1.324	0.978	1.793	0.072	1.222	0.982	1.52
has television	No	0.02	1			0.27	1			<0.001	1			<0.001	1		
	yes	0.02	1.523	1.07	2.17	0.27	1.176	0.882	1.567	<0.001	1.533	1.259	1.868	<0.001	1.398	1.212	1.612
frequency of reading newspaper	not at all	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	less than once a weak	<0.001	2.2	1.755	2.757	<0.001	2.004	1.633	2.46	<0.001	1.601	1.333	1.923	<0.001	1.817	1.618	2.039
	at least once a week	<0.001	4.165	2.233	7.77	0.014	1.901	1.141	3.169	0.136	1.261	0.93	1.711	<0.001	1.65	1.303	2.089
	almost evry day	0.153	1.51	0.858	2.654	0.108	1.557	0.907	2.674					0.158	1.311	0.9	1.911
frequency of listening to radio	not at all	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	less than once a weak	<0.001	1.662	1.33	2.077	<0.001	1.551	1.295	1.858	0.39	1.06	0.929	1.209	<0.001	1.334	1.211	1.469

frequency of watching television	at least once a week	0.049	1.527	1.003	2.326	0.076	1.381	0.967	1.973	0.233	1.105	0.938	1.303	<0.001	1.35	1.179	1.547
	almost every day	<0.001	1.843	1.382	2.457	<0.001	1.625	1.284	2.058					<0.001	1.406	1.211	1.632
	not at all	<0.001	1			<0.001	1			<0.001	1			<0.001	1		
	less than once a weak	<0.001	2.309	1.829	2.915	<0.001	1.994	1.589	2.501	<0.001	1.818	1.591	2.077	<0.001	2.279	2.059	2.522
	at least once a week	<0.001	2.179	1.419	3.348	0.001	2.116	1.366	3.276	<0.001	1.902	1.546	2.34	<0.001	2.498	2.125	2.936
	almost every day	0.002	1.949	1.278	2.973	<0.001	2.318	1.613	3.33					<0.001	2.086	1.701	2.558

DECLARATION

I, the undersigned, senior MPH student declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health.

Name: _____

Signature: _____

Place of submission: School of public Health, College of Medicine and Health Sciences, University of Gondar.

Date of Submission: _____

This thesis work has been submitted for examination with my/ our approval as university advisor(s).

Advisors

Name	Signature
_____	_____
_____	_____

ASSURANCE OF INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research and publications office of the University of Gondar.

Name of the student:_____

Date:_____ Signature: _____

Approval of the advisor (s)

Advisors

	Name	Signature	Date
1.	_____	_____	_____
2.	_____	_____	_____